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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,285	11/25/2003	Rahul Shrivastav	5853-278-1	9081

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EXAMINER	
STOFFREGEN, JOEL	
ART UNIT	PAPER NUMBER
2626	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,285	SHRIVASTAV, RAHUL	
	Examiner	Art Unit	
	Joel Stoffregen	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/06/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the original application filed on 11/25/2003.

2. Claims 1-30 are currently pending in this application. Claims 1, 11, and 21 are independent claims.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 09/06/2005 is being considered by the examiner.

Priority

4. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1, 2, 11, 12, 21, and 22** are rejected under 35 U.S.C. 102(e) as being anticipated by TREURNIET et al. (Patent No.: US 7,164,771).

7. Regarding **claim 1**, TREURNIET teaches a method of diagnosing voices ("objective audio quality measurement system", column 3, lines 56-57) comprising:

processing a test voice signal ("time domain target signal 30", FIG.1, column 4, line 30) using an auditory model ("peripheral ear processor 22", FIG. 1, column 4, line 24);

determining at least one voice quality attribute from the test voice signal ("target basilar sensation signal 34", FIG. 1, column 4, lines 35-36);

comparing ("comparator 24", FIG. 1, column 4, line 38) the at least one voice quality attribute from the test voice signal (34) with at least one baseline voice quality attribute ("reference basilar sensation signal 32", FIG. 1, column 4, lines 35-36); and

based upon said comparing step, determining at least one measure of voice quality of the test voice signal ("produce perceptual quality rating 38", FIG. 1, column 7, line 14).

8. Regarding **claim 2**, TREURNIET further teaches determining a degree of the measure of voice quality ("desired level of accuracy in the quality measure", column 12, line 21).

9. Regarding **claim 11**, TREURNIET teaches a system for diagnosing voices ("objective audio quality measurement system", column 3, lines 56-57) comprising:

means for processing a test voice signal ("time domain target signal 30", FIG.1, column 4, line 30) using an auditory model ("peripheral ear processor 22", FIG. 1, column 4, line 24);

means for determining at least one voice quality attribute from the test voice signal ("target basilar sensation signal 34", FIG. 1, column 4, lines 35-36);

means for comparing ("comparator 24", FIG. 1, column 4, line 38) the at least one voice quality attribute from the test voice signal (34) with at least one baseline voice quality attribute ("reference basilar sensation signal 32", FIG. 1, column 4, lines 35-36); and

means for determining at least one measure of voice quality of the test voice signal based upon said comparing step ("produce perceptual quality rating 38", FIG. 1, column 7, line 14).

10. Regarding **claim 12**, TREURNIET further teaches means for determining a degree of the measure of voice quality ("desired level of accuracy in the quality measure", column 12, line 21).

11. Regarding **claim 21**, TREURNIET teaches a machine readable storage ("computer processing modules", column 12, line 30), having stored thereon a computer

program having a plurality of code sections executable by a machine ("computer", column 12, line 28) for causing the machine perform the steps of:

processing a test voice signal ("time domain target signal 30", FIG.1, column 4, line 30) using an auditory model ("peripheral ear processor 22", FIG. 1, column 4, line 24);

determining at least one voice quality attribute from the test voice signal ("target basilar sensation signal 34", FIG. 1, column 4, lines 35-36);

comparing ("comparator 24", FIG. 1, column 4, line 38) the at least one voice quality attribute from the test voice signal (34) with at least one baseline voice quality attribute ("reference basilar sensation signal 32", FIG. 1, column 4, lines 35-36); and

based upon said comparing step, determining at least one measure of voice quality of the test voice signal ("produce perceptual quality rating 38", FIG. 1, column 7, line 14).

12. Regarding **claim 22**, TREURNIET further teaches determining a degree of the measure of voice quality ("desired level of accuracy in the quality measure", column 12, line 21).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. **Claims 3-5, 13-15, and 23-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over TREURNIET et al. (Patent No.: US 7,164,771) in view of DEAL et al. ("Some Waveform and Spectral Features of Vowel Roughness").

15. Regarding **claim 3**, TREURNIET teaches all the claimed limitation of claim 1.

However, TREURNIET does not disclose that the measure of voice quality is at least one of roughness and hoarseness.

In the same field of speech quality measurement, DEAL discloses a method of measuring vocal roughness. DEAL teaches a measure of voice quality that is at least one of roughness and hoarseness ("provide a quantitative acoustic index predictive of perceived vowel roughness", p. 251, 4th paragraph, where vowel roughness is associated with voice roughness and hoarseness, see p. 251, 2nd paragraph).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of DEAL on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived roughness of a speech signal (see TREURNIET, column 2, lines 20-21).

16. Regarding **claim 4**, DEAL further teaches that the voice quality attributes of the test voice signal include changes in pitch over time and changes in loudness over time ("acoustic measures of period and amplitude variation", p. 251, 4th paragraph).

17. Regarding **claim 5**, DEAL further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness ("acoustic measures of... spectral noise level", p. 251, 4th paragraph).

18. Regarding **claim 13**, TREURNIET teaches all the claimed limitation of claim 11.

However, TREURNIET does not disclose that the measure of voice quality is at least one of roughness and hoarseness.

In the same field of speech quality measurement, DEAL discloses a method of measuring vocal roughness. DEAL teaches a measure of voice quality that is at least one of roughness and hoarseness ("provide a quantitative acoustic index predictive of perceived vowel roughness", p. 251, 4th paragraph, where vowel roughness is associated with voice roughness and hoarseness, see p. 251, 2nd paragraph).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of DEAL on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived roughness of a speech signal (see TREURNIET, column 2, lines 20-21).

19. Regarding **claim 14**, DEAL further teaches that the voice quality attributes of the test voice signal include changes in pitch over time and changes in loudness over time ("acoustic measures of period and amplitude variation", p. 251, 4th paragraph).

20. Regarding **claim 15**, DEAL further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness ("acoustic measures of... spectral noise level", p. 251, 4th paragraph).

21. Regarding **claim 23**, TREURNIET teaches all the claimed limitation of claim 21.

However, TREURNIET does not disclose that the measure of voice quality is at least one of roughness and hoarseness.

In the same field of speech quality measurement, DEAL discloses a method of measuring vocal roughness. DEAL teaches a measure of voice quality that is at least one of roughness and hoarseness ("provide a quantitative acoustic index predictive of perceived vowel roughness", p. 251, 4th paragraph, where vowel roughness is associated with voice roughness and hoarseness, see p. 251, 2nd paragraph).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of DEAL on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived roughness of a speech signal (see TREURNIET, column 2, lines 20-21).

22. Regarding **claim 24**, DEAL further teaches that the voice quality attributes of the test voice signal include changes in pitch over time and changes in loudness over time ("acoustic measures of period and amplitude variation", p. 251, 4th paragraph).

23. Regarding **claim 25**, DEAL further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness ("acoustic measures of... spectral noise level", p. 251, 4th paragraph).

24. **Claims 6-10, 16-20, and 26-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over TREURNIET et al. (Patent No.: US 7,164,771) in view of HILLENBRAND et al. ("Acoustic Correlates of Breathy Vocal Quality").

25. Regarding **claim 6**, TREURNIET teaches all of the claimed limitation of claim 1.

However, TREURNIET does not disclose that the measure of voice quality is breathiness.

In the same field of speech quality measurement, HILLENBRAND discloses a method of measuring vocal breathiness. HILLENBRAND teaches a measure of voice quality that is breathiness ("acoustic measures in predicting breathiness ratings", *abstract*).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of HILLENBRAND on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived breathiness of a speech signal (see TREURNIET, column 2, lines 20-21).

26. Regarding **claim 7**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of low frequency periodic energy

("aspiration noise is inherently weak in the low frequencies", p. 312, 2nd paragraph, meaning the low frequencies contain a strong periodic component).

27. Regarding **claim 8**, HILLENBRAND further teaches 8. The method of claim 6, wherein the voice quality attribute of the test voice signal includes a measure of high frequency aperiodic energy ("periodic component of the voice source is inherently weak in the mid and high frequencies", p. 312, 2nd paragraph, meaning the mid and high frequencies contain a strong aperiodic component).

28. Regarding **claim 9**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness of a periodic signal portion of the test voice signal ("measure of the... average energy below 4 kHz", p. 315, 4th paragraph, where the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

29. Regarding **claim 10**, HILLENBRAND further teaches that the voice quality attributes of the test voice signal include a measure of noise in the test voice signal and a measure of partial loudness of the test voice signal ("measure of the average spectral energy at or above 4 kHz to the average energy below 4 kHz", p. 315, 4th paragraph, where the high frequencies contain noise and the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

30. Regarding **claim 16**, TREURNIET teaches all of the claimed limitation of claim 11.

However, TREURNIET does not disclose that the measure of voice quality is breathiness.

In the same field of speech quality measurement, HILLENBRAND discloses a method of measuring vocal breathiness. HILLENBRAND teaches a measure of voice quality that is breathiness ("acoustic measures in predicting breathiness ratings", *abstract*).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of HILLENBRAND on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived breathiness of a speech signal (see TREURNIET, column 2, lines 20-21).

31. Regarding **claim 17**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of low frequency periodic energy ("aspiration noise is inherently weak in the low frequencies", p. 312, 2nd paragraph, meaning the low frequencies contain a strong periodic component).

32. Regarding **claim 18**, HILLENBRAND further teaches 8. The method of claim 6, wherein the voice quality attribute of the test voice signal includes a measure of high frequency aperiodic energy ("periodic component of the voice source is inherently weak

in the mid and high frequencies", p. 312, 2nd paragraph, meaning the mid and high frequencies contain a strong aperiodic component).

33. Regarding **claim 19**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness of a periodic signal portion of the test voice signal ("measure of the... average energy below 4 kHz", p. 315, 4th paragraph, where the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

34. Regarding **claim 20**, HILLENBRAND further teaches that the voice quality attributes of the test voice signal include a measure of noise in the test voice signal and a measure of partial loudness of the test voice signal ("measure of the average spectral energy at or above 4 kHz to the average energy below 4 kHz", p. 315, 4th paragraph, where the high frequencies contain noise and the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

35. Regarding **claim 26**, TREURNIET teaches all of the claimed limitation of claim 1.

However, TREURNIET does not disclose that the measure of voice quality is breathiness.

In the same field of speech quality measurement, HILLENBRAND discloses a method of measuring vocal breathiness. HILLENBRAND teaches a measure of voice

quality that is breathiness ("acoustic measures in predicting breathiness ratings", *abstract*).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the measurement method of HILLENBRAND on the voice signals of TREURNIET in order to efficiently obtain an estimate of the perceived breathiness of a speech signal (see TREURNIET, column 2, lines 20-21).

36. Regarding **claim 27**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of low frequency periodic energy ("aspiration noise is inherently weak in the low frequencies", p. 312, 2nd paragraph, meaning the low frequencies contain a strong periodic component).

37. Regarding **claim 28**, HILLENBRAND further teaches 8. The method of claim 6, wherein the voice quality attribute of the test voice signal includes a measure of high frequency aperiodic energy ("periodic component of the voice source is inherently weak in the mid and high frequencies", p. 312, 2nd paragraph, meaning the mid and high frequencies contain a strong aperiodic component).

38. Regarding **claim 29**, HILLENBRAND further teaches that the voice quality attribute of the test voice signal includes a measure of partial loudness of a periodic signal portion of the test voice signal ("measure of the... average energy below 4 kHz",

p. 315, 4th paragraph, where the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

39. Regarding **claim 30**, HILLENBRAND further teaches that the voice quality attributes of the test voice signal include a measure of noise in the test voice signal and a measure of partial loudness of the test voice signal ("measure of the average spectral energy at or above 4 kHz to the average energy below 4 kHz", p. 315, 4th paragraph, where the high frequencies contain noise and the low frequencies contain a periodic signal, see p. 312, 2nd paragraph).

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. A list of the pertinent prior art is on the included form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel Stoffregen whose telephone number is (571) 270-1454. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

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